Seasonal Abundance and Distribution of Adult Caddisflies of Sashin Creek, Baranof Island, Southeastern Alaska

(Trichoptera)

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In this paper I record 21 species of adult caddisflies collected along Sashin Creek and vicinity and describe their relative abundance and spatial distribution. Also, incidental observations on biology are recorded for several species. The collections were made intermittently from 1965 through 1972.

Sashin Creek is located at approximately lat 56°23'N, long 134°44'W, on the southeast shore of Baranof Island, southeastern Alaska (Fig. 1). The annual range in volume of flow is about 0.2 to 20 m^3/s. This study was conducted in and near the stream between its mouth at tidewater and a 30-m falls about 1,200 m upstream. The stream water is generally cool, clear, and fast-moving, and the substrate is mostly gravel and rubble. Further details of the physical and biological setting are available in Ellis (1975).

Materials and Methods

Most of the collecting was done along the stream below the falls but some was done above the falls and at nearby lighted windows. I collected with an air net and by hand-picking with forceps at lights. A few species were collected only at lights. A gasoline lantern and white sheet were used at three sites below the falls — one close to tidewater, one about 300 m, and another about 500 m above tidewater. Lighted windows were visited at residences at the mouth of the stream (residence I) and about 300 m away along the shore of the estuary (residence II). None of the sampling was done on a regular time or area basis, but on most sampling days, collections were made from tidewater to falls. The following discussion and list of adult caddisflies from Sashin Creek are based on specimens collected along the stream below the falls with air net unless otherwise noted.

Seasonal Distribution and Abundance

On 48 days between 6 June and 4 October I made 206 collections which yielded 735 adult caddisflies. To compare seasonal occur-

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rence, it is assumed that timing and sequence of emergence of caddisflies are essentially the same from year to year in Sashin Creek and therefore all collections are combined from 1965 through 1972. The distribution of collecting by period (approximately a week) is summarized in Figure 2 together with periods of occurrence for each species. No collections were made between the first weeks of October and March which may explain the absence of *Glyphopsyche irrorata* and presence of only one specimen of *Psychoglypha subborealis*, both winter caddisflies common in the Juneau, Alaska area (Ellis, 1978).

Several species of caddisflies differed in abundance and length of occurrence and I have combined the collection data under six general categories (Table 1 and Fig. 2). The categories and species are:

1. Very abundant for several weeks:
   Ecclisocosmoecus scylla (330 specimens in 52 collections made on 31 days)
2. Abundant for several weeks:
   Onocosmoecus unicolor (83 specimens in 41 collections made on 23 days)

   Dicosmoecus atripes (88 specimens in 29 collections made on 18 days)
3. Very common for a few weeks:
   Ecclisomyia conspersa (56 specimens in 20 collections made on 9 days)

   Rhyacophila alberta (38 specimens in 24 collections made on 11 days)

   Lenarchus vastus (32 specimens in 23 collections made on 15 days)
4. Common for a few weeks:
   Lepidostoma roafi (19 specimens in 14 collections made on 10 days)

   Rhyacophila narvae (16 specimens in 12 collections made on 9 days)

   Polycentropus halidus (16 specimens in 13 collections made on 9 days)
5. Occasional over several weeks:
   Rhyacophila vaccua (5 specimens in 3 collections made on 3 days)

   Rhyacophila vao (10 specimens in 3 collections made on 3 days)

   Limnephilus harrimani (7 specimens in 6 collections made on 6 days)

   Limnephilus nogus (6 specimens in 6 collections made on 6 days)

   Limnephilus sitchensis (6 specimens in 5 collections made on 5 days)

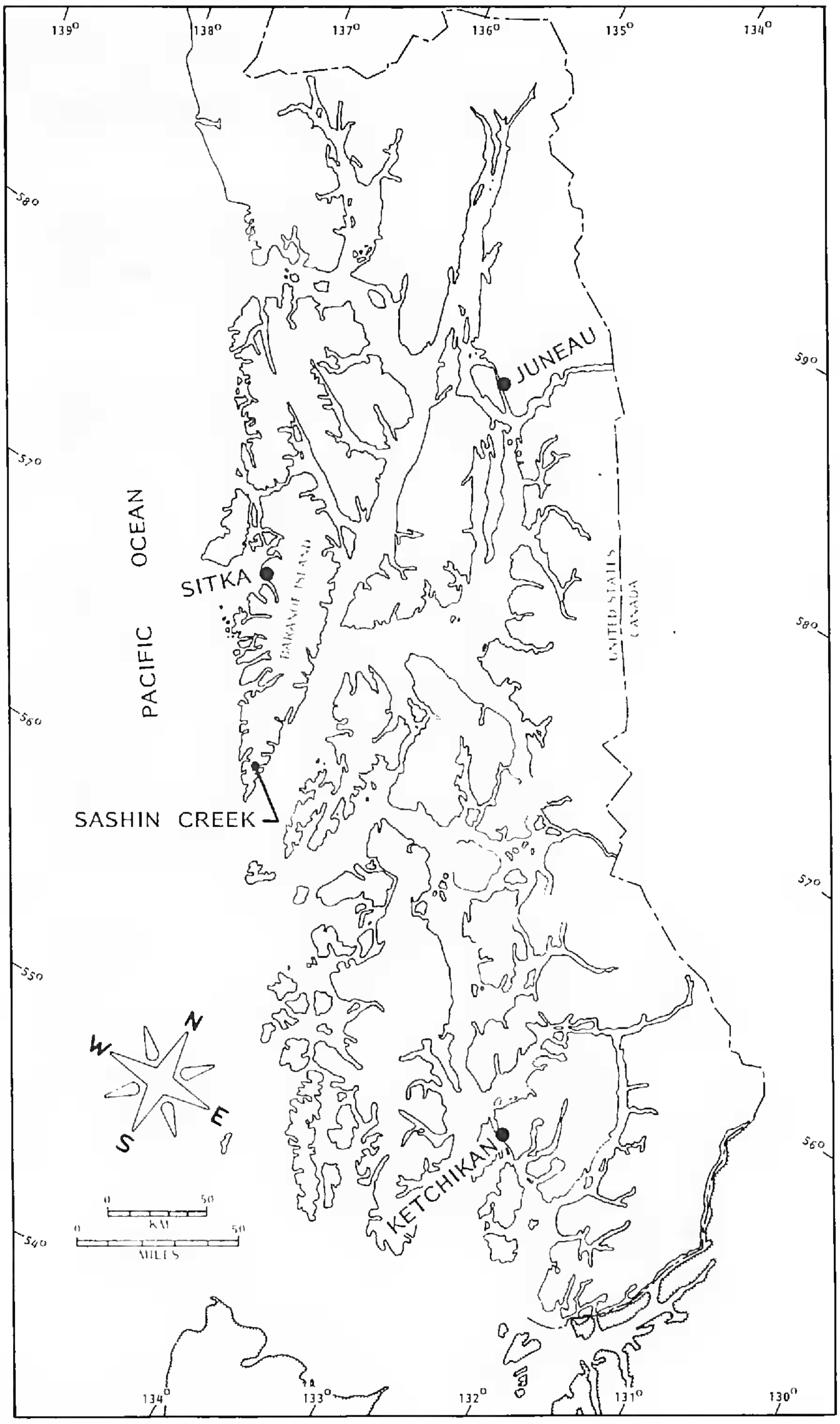

Fig. 1. Map showing location of Sashin Creek in southeastern Alaska.

6. Rare for up to a few weeks:
   Glossosoma penitum (2 specimens collected on 2 days)
   Rhyacophila rickeri (1 specimen)
   Rhyacophila grandis (1 specimen)
   Rhyacophila verrula (2 specimens collected on 2 days)
   Ptilostomis ocellifera (2 specimens collected on 2 days)
   Micrasema sp. (2 specimens in one collection)
   Parapsyche elsis (1 specimen)
   Chyranda centralis (1 specimen)

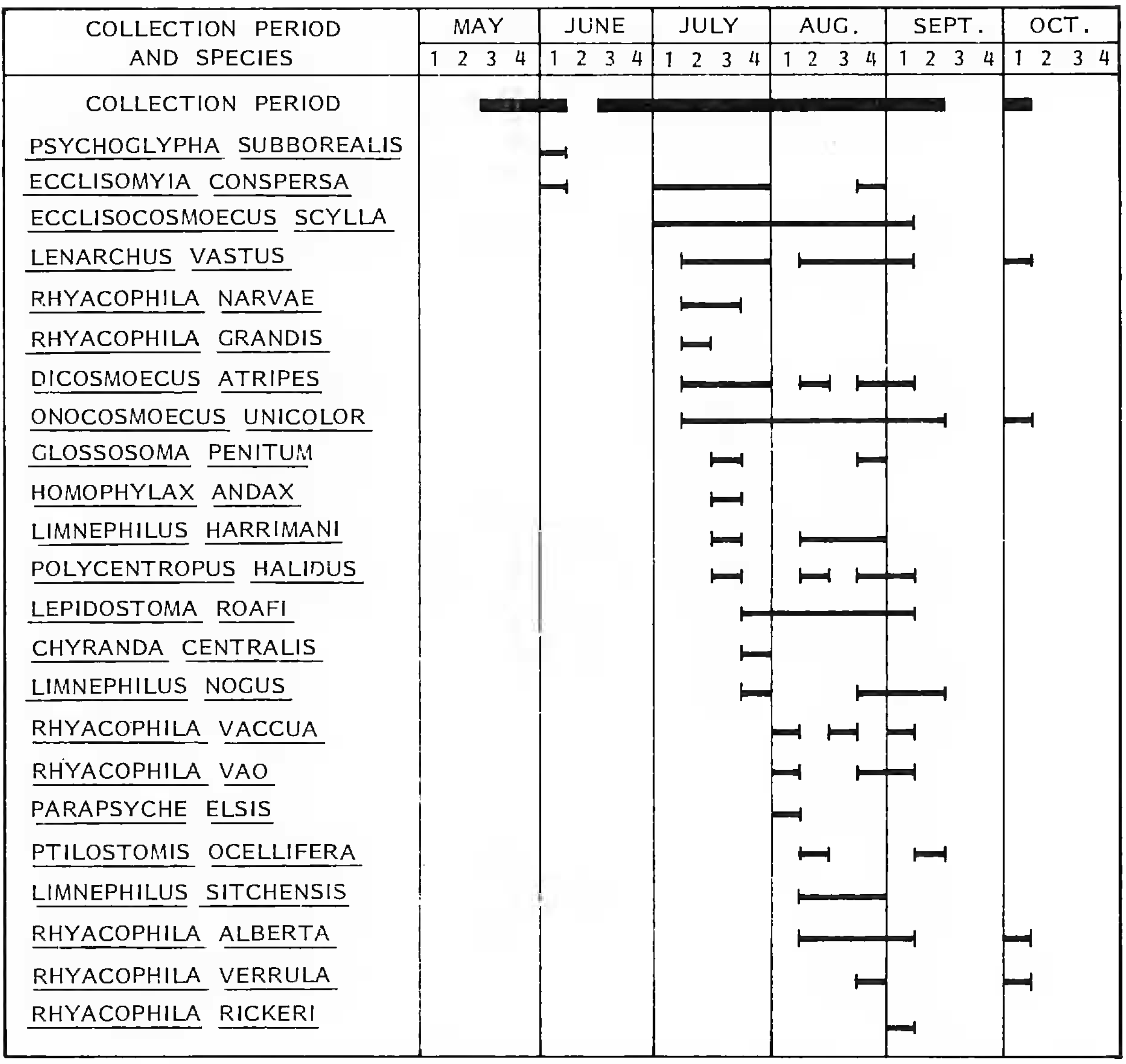

Fig. 2. Periods when collections of caddisflies were made in Sashin Creek 1965-72 (top line), and periods of occurrence of each species by week.

Homophylax andax (2 specimens in 1 collection)
Psychoglypha subborealis (1 specimen).

The main period of appearance of adult caddisflies in Sashin Creek is from mid to late summer (Fig. 2). The seasonal progression of species emerging and the long period of emergence (or long adult life) for some species make it likely that 8 to 12 species can be collected on any day from about 15 July to 7 September.

Identification of Material

The caddisflies of Alaska have not been treated as a unit and the descriptions are scattered in the literature. The basic reference work for the material reported here is Denning (1956). Dr. D.G. Denning either identified specimens or verified my identifications of all species reported here. Responsibility for correct identifications of all remaining material not seen by him is my own.

Table 1. Number of specimens, collections, and collection days for each species of adult caddisfly collected in Sashin Creek, 1965-72.

Family and species	Number of specimens Males	Number of specimens Females	Number of collections	Number of collection days
Rhyacophilidae				
Rhyacophila alberta	36	2	24	11
Rhyacophila grandis	1	0	1	1
Rhyacophila narvae	13	3	12	9
Rhyacophila rickeri	1	0	1	1
Rhyacophila vaccua	5	0	3	3
Rhyacophila vao	8	2	6	3
Rhyacophila verrula	2	0	2	2
Rhyacophila spp.	0	14	9	9
Glossosomatidae				
Glossosoma penitum	2	0	2	2
Phryganeidae				
Ptilostomis ocellifera	0	2	2	2
Lepidostomatidae				
Lepidostoma roafi	19	0	14	10
Lepidostoma sp.	0	8	8	6
Brachycentridae				
Micrasema sp.	1	1	1	1
Polycentropodidae				
Polycentropus halidus	1	15	13	9
Hydropsychidae				
Parapsyche elsis	0	1	1	1
Limnephilidae				
Chyranda centralis	1	0	1	1
Dicosmoecus atripes	71	17	29	18
Ecclisomyia conspersa	47	9	20	9
Ecclisocosmoecus scylla	295	35	52	31
Homophylax andax	2	0	1	1
Lenarchus vastus	10	22	23	15
Limnephilus harrimani	7	0	6	6
Limnephilus nogus	1	5	5	5
Limnephilus sitchensis	1	5	5	5
Onocosmoecus unicolor	47	36	41	23
Psychoglypha subborealis	0	1	1	1

Collection Data

RHYACOPHILIDAE.—Seven species of *Rhyacophila* were found — one was very common *(R. narvae),* one was common *(R. alberta),* and the rest were occasional or rare.

Rhyacophila alberta Banks.—Most abundant rhyacophilid. Thirty-six males, two females, August to September, in 24 collections on 11 days. Above and below falls, air net and light.

Rhyacophila grandis Banks.—One male. Captured at light at residence II on 12 July.

Rhyacophila narvae Navás.—Thirteen males, seven females, in 12 collections on nine days, 11 July to 30 August, above and below the falls.

Rhyacophila rickeri Ross.—One male. Captured above the falls on 1 September.

Rhyacophila vaccua Milne.—Five males, no females, in three collections on three days, 1 August to 1 September, above and below the falls.

Rhyacophila vao Milne.—Eight males, two females, in six collections on three days, 1 August to 1 September, above and below the falls.

Rhyacophila verrula Milne.—Two males, no females in two collections on two days, 29 August and 4 October.

Rhyacophila spp.—Fourteen females, in nine collections on nine days, 19 July to 2 September.

GLOSSOSOMATIDAE.—A single species, *Glossosoma penitum* Banks. Two males in two collections, 19 July and 27 August, above and below the falls.

PHRYGANEIDAE.—A single species, *Ptilostomis ocellifera* (Walker). Two females in two collections on 9 and 13 August. Both collections at light. One female contained 50 eggs.

LEPIDOSTOMATIDAE.—A single species was identified, *Lepidostoma roafi* (Milne). Nineteen males, no females in 14 collections made on 10 days, 24 July to 1 September. Eight females in eight collections are referred to as *Lepidostoma* sp.

BRACHYCENTRIDAE.—A single species, *Micrasema* sp. (bactro group). One male and one female in one collection, 15 July.

POLYCENTROPODIDAE.—A single species, *Polycentropus halidus* Milne. One male, 15 females in 13 collections from lights and air net on nine days, 15 July to 2 September.

HYDROPSYCHIDAE.—A single species, *Parapsyche elsis* Milne. One female above falls, 1 August.

LIMNEPHILIDAE.—The limnephilids were the dominant caddisflies in the study area both in total numbers (over 75% of all specimens) and in number of species (11, or about 45% of the number of species collected). The four most abundant species were *Ecclisocosmoecus scylla, Dicosmoecus atripes, Ecclisomyia conspersa,* and *Onocosmoecus unicolor.*

Chyranda centralis (Banks).—One male, 29 July.

Dicosmoecus atripes (Hagen).—Seventy-one males, 17 females, 11 July to 2 September, air net and lights (including residence I). The second most abundant species in this study. The larvae of this large limnephilid were conspicuous in the stream; they are often eaten by the water ouzel as evidenced by the abundant empty cases on the near-water sites frequented by this bird.

Ecclisomyia conspersa (Banks). — Forty-seven males, nine females in 20 collections on nine days from 6 June to 30 August, above and below the falls, air net and light. The fourth most abundant species in this study.

Ecclisocosmoecus scylla (Milne).—Two hundred ninety-five males, 35 females in 52 collections on 31 days from 2 July to 2 September, above and below the falls. This was the most abundant species in the study area and was abundant in both air net and light collections.

Homophylax andax (Ross). — Two males in one collection from a light on 15 July.

Lenarchus vastus (Hagen).—Ten males, 22 females in 23 collections on 15 days from 10 July to 5 October. Although most collections were from lighted windows at residence II, three collections were made with air net along the Creek — one above the falls and two below.

Limnephilus harrimani (Banks). — Seven males in six collections, 18 July to 27 August. The type locality of this species is in Alaska.

Limnephilus nogus (Ross). — One male, five females in five collections, 30 July to 1 September. Collections made only at mouth of Sashin Creek with air net (one collection) and at lights at residence II. Perhaps larvae do not live in Sashin Creek.

Limnephilus sitchensis (Kolenati).—One male, five females in five collections on five days from 9 August to 24 August, air net and light. The females have not been illustrated but the wing patterns of males and females are similar. Type locality is in Alaska.

Onocosmoecus unicolor (Banks).—Forty-seven males, 36 females in 41 collections on 23 days from 11 July to 4 October. Below falls only, air net and lights (including residence I). The third most abundant species in the study area.

Psychoglypha subborealis (Banks).—One female on 6 June, below falls. This is a winter species usually collected only from fall to spring (October to May in southeastern Alaska). Type locality is in Alaska.

Literature Cited

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Ellis, R.J. 1975. Seasonal abundance and distribution of adult stoneflies of Sashin Creek, Baranof Island, southeastern Alaska. Pan-Pacific Entomol., 51:23-30.

Ellis, R.J. 1978. Over-winter occurrence and maturation of gonads in *Psychoglypha subborealis* (Banks) and *Glyphopsyche irrorata* (Fabricius) (Trichoptera: Limnephilidae). Pan-Pacific Entomol., 54:178-180.

SCIENTIFIC NOTE

Goniopsita oophaga **(Diptera: Chloropidae) A Predator of Grasshopper Eggs.** — At the time of its description *Goniopsita oophaga* Sabrosky was associated as an egg predator of *Melanoplus sanguinipes* (Fabricius) and its possible economic significance was pointed out (Sabrosky, 1967. J. Kansas Entomol. Soc., 40:151-156). Information presented herein extends the host range of *G. oophaga* to include a slant-faced grasshopper, *Chloealtis aspasma* Rehn and Hebard and covers the frequency and extent of predation on that host.

During 1972 and 1973 numerous ovipositional sites of *C. aspasma* were noted in dead, pithy stems of elderberry, *Sambucus* sp. Oviposition was also induced using stick traps cut from elderberry (Foster, 1974. Pan-Pacific Entomol., 50:207-208). During both years numerous fly larvae were observed infesting egg pods of *C. aspasma*. Egg pods returned to the insectary during May, 1973 yielded larvae from which *G. oophaga* adults were reared.

Predation data from the total of 204 *C. aspasma* egg pods examined during the study are tabulated below. Of these, 138 (68 percent) were infested with *G. oophaga* larvae and pupae. Substantial egg mortality due to the chloropid is further indicated by comparing the average number of eggs destroyed per infested pod (7.1) with the observed average oviposition rate of *C. aspasma* (7.9). Egg counts of the 204 pods revealed 1,621 grasshopper eggs, of which 981 (60.5 percent) were destroyed by *G. oophaga* larvae.

Present knowledge of the life history of *G. oophaga* is fragmentary. The presence of two dead females entrapped on the surface of the recessed plugs of two egg pods indicates that females may oviposit in the immediate vicinity of the egg pod cap. Although the grasshopper's ovipositional period extends from mid-July through August, there is no evidence that more than one generation of the chloropid develops per year on this host.

All specimens taken during this study were collected 16 mi. northeast of Ashland, Jackson County, Oregon.

I wish to thank Drs. Ashley B. Gurney and Curtis W. Sabrosky, both of the Systematic Entomology Laboratory, USDA, Washington, D.C., for their respective identifications of *C. aspasma* and *G. oophaga*, and Dr. W.F. Barr, University of Idaho, who provided laboratory space and helped with certain aspects of the field work. — **David E. Foster,** *Department of Entomology and The Museum, Texas Tech University, Lubbock, Texas 79409.*

Egg Pod Data	Total Number	Percent	Average Number/Pod	Range
Egg pods examined	204	----	----	----
C. aspasma eggs	1621	----	7.9	4-8
Egg pods infested	138	68	----	----
G. oophaga larvae and pupae	575	----	2.3	1-10
Number eggs destroyed	981	60.5	----	----
Number eggs destroyed/fly	----	----	1.7	1-4
Number eggs destroyed/infested pod	----	----	7.1	0-8

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